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BROADCAST SIGNAL RECEIVER

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[There are no amendments to this patent.]

Abstract

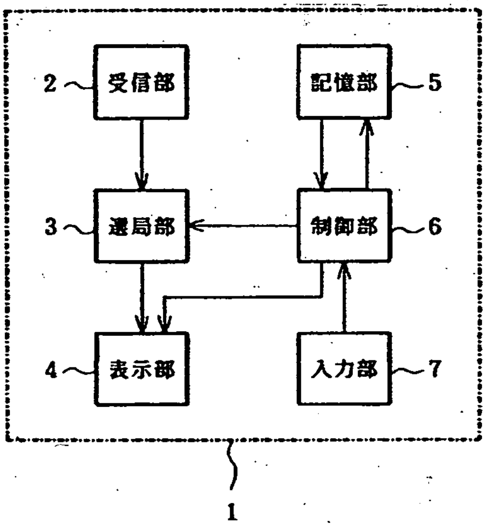
Problem

To provide a broadcast receiving device that will automatically display the channel recording procedure, and that can make channel recording easy and that can also make channel

selection easy in multi-channel broadcasts by automatically deleting channels with a low frequency of selection.

Means to solve

Controller (6) controls display (4) so that it will display the procedure for recording a channel when the current channel is not recorded in memory (5) has been tuned in continuously for more than 20 minutes. Display (4) displays a message that recommends channel recording on a display screen. Controller (6) also deletes the channel with the lowest frequency of selection from the channels already recorded when the maximum number of recorded channels that can be stored in memory (5) is exceeded due to the recording of a new channel according to channel recording commands and it controls memory (5) so that the new channel will be stored.



Key:

2	Receiver
3	Tuner
4	Display
5	Memory
6	Controller
7	Input

Claims

1. Broadcast receiving device that is equipped with: a receiving means that receives multi-channel broadcasts; a selection means that selects specific channels from the multi-channel broadcasts received by the aforementioned receiving means; a memory means that stores channels recorded by a viewer from the multi-channel broadcast; an input means for inputting channel selection commands that indicate channels to be selected from the multi-channel broadcasts and channel recording commands that indicate channels to be stored in the

aforementioned memory means; a control means that controls the aforementioned selection means so that channels are selected according to the aforementioned channel selection commands; and a display means that displays the broadcast contents of the specific channels selected by the aforementioned selection means on a display screen;

the aforementioned control means controls the aforementioned display means so that the procedure for recording selected channels in the aforementioned memory means will be displayed when a channel that has not been recorded in the aforementioned memory means is selected continuously for longer than a predetermined period of time.

2. Broadcast receiving device that is equipped with: a receiving means that receives multi-channel broadcasts; a selection means that selects specific channels from the multi-channel broadcasts received by the aforementioned receiving means; a memory means that stores channels recorded by a viewer from the multi-channel broadcasts; an input means for inputting channel selection commands that indicate channels to be selected from the multi-channel broadcasts and channel recording commands that indicate channels to be stored in the aforementioned memory means; a control means that controls the aforementioned selection means so that channels are selected according to the aforementioned channel selection commands; and a display means that displays the broadcast contents of specific channels selected by the aforementioned selection means on a display screen;

the aforementioned memory means also stores the channel selection time after recording for each recorded channel;

the aforementioned control means deletes the channel with the shortest total amount according to the aforementioned channel selection time from among the channels that have already been recorded and controls the aforementioned memory means so that a new channel is stored according to the channel recording commands when the maximum number of recorded channels that can be stored in the aforementioned memory means is exceeded due to the recording of a new channel according to the aforementioned channel recording commands.

3. Broadcast receiving device equipped with: a receiving means that receives multi-channel broadcasts; a selection means that selects specific channels from the multi-channel broadcasts received by the aforementioned receiving means; a memory means that stores channels recorded by a viewer from the multi-channel broadcast; an input means for inputting channel selection commands that indicate channels to be selected from the multi-channel broadcasts and channel recording commands that indicate channels to be stored in the aforementioned memory means; a control means that controls the aforementioned selection means so that channels are selected according to the aforementioned channel selection commands; and a display means that displays the broadcast contents of the specific channels selected by the aforementioned selection means on a display screen;

the aforementioned memory means also stores the channel selection time after recording and elapsed time since recording for each recorded channel;

the aforementioned control means deletes the channel with the lowest frequency of selection, based on the ratio of the aforementioned elapsed time and the aforementioned channel selection time, from channels already recorded, and controls the aforementioned memory means so that a new channel is stored according to the aforementioned channel recording commands when the maximum number of recorded channels that can be stored in the aforementioned memory means is exceeded due to the recording of a new channel according to the aforementioned channel recording commands.

Detailed explanation of the invention

[0001]

Technical field the invention

The present invention pertains to a broadcast receiving device. In particular, it pertains to a broadcast receiving device that can receive multi-channel broadcasting services, e.g., satellite broadcasting and cable broadcasting.

[0002]

Prior art

As is known, digital broadcasting using satellites or the like has become possible with image information compression techniques that include MPEG2, and it has become possible to provide more than 100 channels with a single broadcasting service.

[0003]

In general, there are two types of systems, discussed below, for methods of selecting programs within such multi-channel services. The first system is an EPG (electronic program guide) where time slots and channels or time slots and program categories are displayed on a screen and programs are selected from the displayed schedule. With this EPG system, there is a limit to the number of programs that can be displayed on one screen (around 10 programs), and complicated operations, such as changing the screen display multiple times in order to look through the screen pages, or hierarchical menu operations for tracking program categories are necessary.

[0004]

The second method is a recorded channel method where a viewer sets up remote control buttons to select channels that have already been recorded in order. As the channel recording method with this system, approximately 10 channels can be recorded in a function setting menu on the broadcast receiving device.

[0005]

Problems to be solved by the invention

With the aforementioned system, the function setting menu operation is a complicated operation for the general viewer, and when the number of recorded channels exceeds the recording limit, it becomes necessary for the viewer to store or delete selected channels and their numbers. The result is that managing this recorded channel list will become very difficult.

[0006]

Also, with conventional broadcasting, one channel would have broadcast a variety of broadcasting genres, e.g., news, movies, and sports, for each time slot. Thus, the viewer would search for and select programs that he wants to watch from the program schedule. However, in multi-channel broadcasts, there is a larger number of channels broadcasting a specific genre of program, such as news, movies, and sports, than channels broadcasting general programs as in conventional broadcasting. In cases such as this, it will be a major problem for a viewer to find contents that he wants to watch in a short time from among the channels that broadcast specific programs that match his interests.

[0007]

When channels and programs are selected with a conventional broadcast receiving device receiving a multi-channel broadcast service as above, operation is complicated, and the problem has been that it is difficult for the viewer to use.

[0008]

In order to solve the aforementioned problems, the purpose of the present invention is to provide a broadcast receiving device that automatically displays the channel recording procedure and that can make channel recording easy and that can also make channel selection easy in multi-channel broadcasts by automatically deleting channels with a low frequency of selection.

[0009]

Means to solve the problems

In order to solve the aforementioned problems, the broadcast receiving device of the present invention is equipped with: a receiving means that receives multi-channel broadcasts; a selection means that selects specific channels from the multi-channel broadcasts received by the receiving means; a memory means that stores channels recorded by a viewer from the multi-channel broadcast; an input means for inputting channel selection commands that indicate channels to be selected from the multi-channel broadcasts and channel recording commands that indicate channels to be stored in the memory means; a control means that controls the selection means so that channels are selected according to the channel selection commands; and a display means that displays the broadcast contents of the specific channels selected by the selection means on a display screen. The control means controls the display means so that the procedure for recording selected channels in the memory means is displayed when a channel that has not been recorded in the memory means has been selected continuously for longer than a predetermined period of time.

[0010]

With the aforementioned constitution, the channel recording procedure can be displayed automatically. Thus, the viewer will be able to record channels based on the contents of the channels and programs without having to learn a complicated recording operation and without having to know the channel numbers being watched, and channel recording in multi-channel broadcasts can be made easy. The result is that the desired channels can be selected on the basis of the recorded channels, and channel selection can be made easy.

[0011]

Another broadcast receiving device according to the present invention is equipped with: a receiving means that receives multi-channel broadcasts; a selection means that selects specific channels from the multi-channel broadcasts received by the receiving means; a memory means that stores channels recorded by a viewer from the multi-channel broadcasts; an input means for inputting channel selection commands that indicate channels to be selected from the multi-channel broadcasts and channel recording commands that indicate channels to be stored in the memory means; a control means that controls the selection means so that channels are selected according to the channel selection commands; and a display means that displays the broadcast contents of the specific channels selected by the selection means on a display screen. The memory means also stores the channel selection time after recording for each recorded channel. The control means deletes the channel with the shortest total according to the channel selection time from among the channels that have already been recorded and controls the memory means so that a new channel is stored according to channel recording commands when the maximum number of channels that can be recorded in the memory means is exceeded due to the recording of a new channel according to the channel recording commands.

[0012]

With the aforementioned constitution, when the number of recorded channels exceeds the maximum number of recorded channels, the channel with the shortest total channel selection time can be automatically deleted from the channels that have already been recorded. Thus, the channel that should be deleted can be automatically deleted according to the viewing history up to that point and new channels can be recorded easily and in a short time. The result is that channel recording can be made easy in multi-channel broadcasts. The desired channel can also be selected based on the recorded channels, and channel selection can be made easy.

[0013]

Still another broadcast receiving device according to the present invention is equipped with: a receiving means that receives multi-channel broadcasts; a selection means that selects specific channels from the multi-channel broadcasts received by the receiving means; a memory means that stores channels recorded by a viewer from the multi-channel broadcasts; an input means for inputting channel selection commands that designate channels to be selected from the multi-channel broadcasts and channel recording commands that designate channels to be stored in the memory means; a control means that controls the selection means so that channels are selected according to the channel selection commands; and a display means that displays the broadcast contents of specific channels selected by the selection means on a display screen. The memory means also stores the channel selection time after recording and elapsed time since recording for each recorded channel. The control means deletes the channel with the lowest frequency of selection, based on the ratio of the elapsed time and the channel selection time, from channels already recorded, and controls the memory means so that a new channel is stored according to the channel recording commands when the maximum number of recorded channels that can be stored in the memory means is exceeded due to the recording of a new channel according to the channel recording commands.

[0014]

With the aforementioned constitution, when the number of recorded channels exceeds the maximum number of recorded channels, the channel with the lowest frequency of selection, based on the ratio of elapsed time and channel selection time, can be automatically deleted from the channels that have already been recorded. Thus, the channel to be deleted can be selected automatically according to the viewing history up to that point, and new channels can be recorded easily and in a short time. The result is that channel recording in multi-channel broadcasts can be made easy. The desired channel can also be selected based on the recorded channels, and channel selection can be made easy.

[0015]

Embodiment of the invention

Below, a broadcast receiving device according to one embodiment of the present invention will be explained with reference to the figures. Figure 1 is a block diagram that shows the constitution of a broadcast receiving device according to one embodiment of the present invention.

[0016]

Referring to Figure 1, broadcast receiving device (1) includes receiver (2), tuner (3), display (4), memory (5), controller (6), and input (7). Receiver (2) receives video broadcast and audio broadcasts from multi-channel broadcasts. Tuner (3) tunes specific channels from the video broadcasts and audio broadcasts received by receiver (2). Input (7) accepts operating commands to broadcast receiving device (1) from the viewer. Memory (5) stores channels that the user has recorded from the group of channels that can be viewed. Controller (6) controls the channel to be tuned by tuner (3) according to operating commands from input (7) and controls changes in the contents of memory (5). Display (4) displays commands from controller (6) and input from tuner (3) on a display screen, e.g., a television.

[0017]

The viewer indicates the channel he wants to receive with input (7) of broadcast receiving device (1). Input (7) could be incorporated into the main part of broadcast receiving device (1) or it could also be made in the form of a remote control so that it can be operated at a distance from the main part of broadcast receiving device (1). The three methods described below are provided as methods for indicating channels. The first method is a ten-key selection system where channel numbers are indicated by ten keys from 0 to 9. The second method is a sequential selection system where the channel before or after the selected channel is selected from the group of channels that can be selected. The third system is a recorded channel recording system where channels recorded by the viewer are selected in channel number order.

[0018]

Next, the operation of broadcast receiving device (1) constituted in the aforementioned way will be explained. Figure 2 is a flow chart for explaining the operation of the broadcast receiving device shown in Figure 1. Steps in the flow chart shown below are performed by different parts under the control of controller (6).

[0019]

Referring to Figure 2, first, a channel is tuned with a ten-key selection system or sequential selection system at step S1, and control is moved to step S2. At step S2, it is judged whether the channel that the viewer has tuned has already been recorded by the viewer in memory (5). When it is a recorded channel (yes at step S2), control is moved to step S3, and the next channel tuning command is awaited while the selection time is measured.

[0020]

On the other hand, when the tuned channel has not been recorded in memory (5) (no at step S2), control is moved to step S4 and the time after selection is measured. Here, when it is sensed that it has been tuned more than 20 minutes (yes at step S4), a message, e.g., "Record channel currently being watched as a favorite channel? Record by pressing channel record button" is displayed on the screen at step S5, the method for recording the channel that is currently being watched in the list of channels that the viewer watches frequently is shown to the viewer, and control is moved to step S6. Here, the aforementioned measured time is found with a time measurement device (omitted from the figure) in controller (6). Display of the recording procedure is not limited to the aforementioned message, and it could also be displayed with other specific character strings or symbols. The selection time is also not limited to 20 minutes but could also be another time interval.

[0021]

Next, when there is no channel recording command (no at step S6), control returns to step S4, and the passage of 20 minutes or another channel selection is awaited. On the other hand, when channel recording is indicated (yes at step S6), control is moved to step S7. It is judged whether the number of recorded channels will exceed the preset maximum number of recorded channels by recording a new channel.

[0022]

When it is judged that the number of recorded channels is within the restricted range even with a new recording (yes at step S7), control is moved to step S8. On the other hand, when it is judged that the restricted limit will be exceeded by a new recording (no at step S7), control is moved to step S9. The channel with the lowest frequency of selection among the recorded channels is found, that channel is deleted from the recorded channels stored in memory (5), and then control is moved to step S8.

[0023]

Multi-channel services provide channels with various types of programs on one channel, as in current ground air-wave broadcasting, and specialized channels for specific programs, e.g., news or sports. Particularly in specialized programs, channel selection is analogous to program selection, and the favorites of each viewer will correspond to the channels that he normally watches. Thus, by finding the channel with the lowest frequency of selection among the recorded channels, deleting that channel from the recorded channels, and recording the currently tuned channel that has been watched for a predetermined period of time, channels that the viewer likes can be recorded and channel selection can be made easy.

[0024]

Here, finding the channel with the lowest frequency of selection is accomplished by finding the channel with the lowest total channel selection time after recording from among the channels that are already recorded. In concrete terms, the channel selection time after recording for each recorded channel is stored in memory (5) for each channel. The channel with the lowest total channel selection time is set to the channel with the lowest frequency of selection based on these data.

[0025]

As another method for finding the channel with the lowest frequency of selection, the channel with the lowest frequency of selection could also be found based on the ratio of the channel selection time after recording and the elapsed time after recording from among the channels that have already been recorded. In concrete terms, the channel selection time after recording and the elapsed time after recording of each recorded channel could be stored in memory (5) for each channel, and the channel with the lowest frequency of selection could be found based on the ratio of these times.

[0026]

Next, at step S8, the channel that is currently tuned is recorded in channel memory (5). Control is moved to step S3, and the next channel tuning command is awaited while the selection time is measured. In this way, by recommending that the viewer record a channel when an unrecorded channel is watched for a predetermined period of time, the viewer will be able to make a decision based on the contents that he is watching.

[0027]

Effect of the invention

With the broadcast receiving device of the present invention, the channel recording procedure can be displayed automatically. Thus, it will be possible for the viewer to record channels based on the contents of channels and programs without having to learn a complicated recording operation or having to know the channel number being watched, and channel recording in multi-channel broadcasts can be made easy. The result is that the desired channel can be selected based on channels that are recorded, and channel selection can be made easy.

Brief description of the figures

Figure 1 is a block diagram that shows the constitution of a broadcast receiving device based on one application example of the present invention.

Figure 2 is a flow chart that for explaining the operation of the broadcast receiving device shown in Figure 1.

Explanation of reference symbols

1	Broadcast receiving device
2	Receiver
3	Tuner
4	Display
5	Memory
6	Controller
7	Input

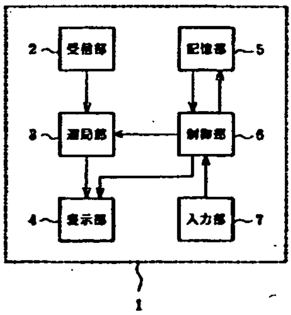


Figure 1

Key:	2	Receiver
	3	Tuner

4	Display
5	Memory
6	Controller
7	Input

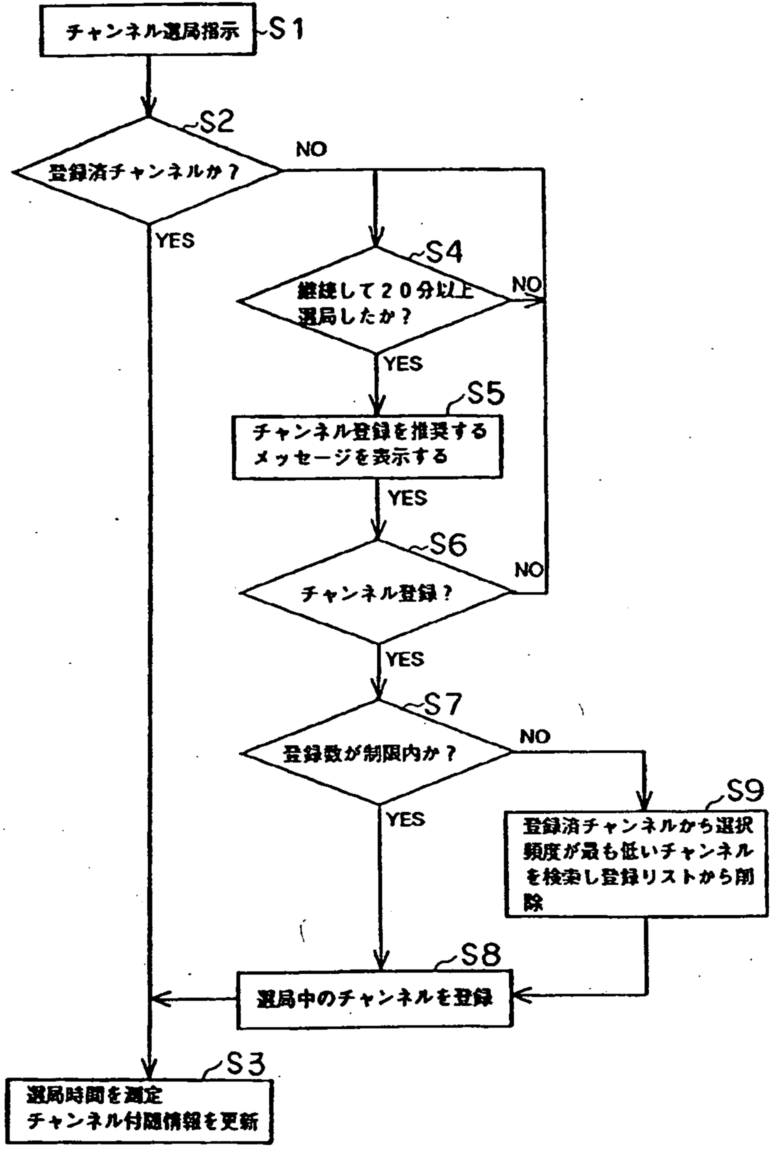

チャンネル選局指示
S1
登録済チャンネルか？
S2
NO
YES
継続して２０分以上選局したか？
S4
NO
YES
チャンネル登録を推奨するメッセージを表示する
S5
YES
チャンネル登録？
S6
NO
YES
登録数が制限内か？
S7
NO
YES
登録済チャンネルから選択頻度が最も低いチャンネルを検索し登録リストから削除
S9
選局中のチャンネルを登録
S8
選局時間を測定
チャンネル付随情報を更新
S3

Figure 2

Key:

S1	Channel tuning command
S2	Recorded channel?
S3	Measure selection; update auxiliary channel information
S4	Tuned continuously more than 20 minutes?
S5	Display message that recommends recording channel
S6	Channel recording?
S7	Number of recorded channels within limit?
S8	Record tuned channel
S9	Find channel with lowest frequency of selection from recorded channels and delete from recorded list

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